

CLAIMS

1. A solid oxide fuel cell stack, comprising:
an electrochemical cell having an electrolyte disposed between
and in ionic communication with a first electrode and a second electrode; and
at least one interconnect disposed in fluid and thermal
5 communication with at least a portion of said electrochemical cell, said
interconnect comprising an electrical supply connector.
2. The solid oxide fuel cell stack of Claim 1, wherein said
interconnect comprises a material selected from the group comprising silver,
copper, ferrous materials, strontium, lanthanum, chromium, chrome, gold,
platinum, palladium, nickel, titanium, conducting ceramics, as well as alloys,
5 oxides, cermets, composites, and combinations comprising at least one of the
foregoing materials.
3. The solid oxide fuel cell stack of Claim 1, wherein said
interconnect has a thickness of less than or equal to about 1 mm.
4. The solid oxide fuel cell stack of Claim 3, wherein said
interconnect has a thickness of about 0.01 mm to about 0.1 mm.
5. The solid oxide fuel cell stack of Claim 3, wherein said
interconnect has a thickness of about 0.03 mm to about 0.05 mm.
6. The solid oxide fuel cell stack of Claim 1, further
comprising at least one switch disposed in electrical communication with said
electrical connector.
7. The solid oxide fuel cell stack of Claim 1, wherein said
interconnect has a resistance of greater than or equal to about 1.2 ohms/cell.

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8. The solid oxide fuel cell stack of Claim 7, wherein said resistance is greater than or equal to about 2 ohms/cell.

9. The solid oxide fuel cell stack of Claim 8, wherein said resistance is greater than or equal to about 3 ohms/cell.

10. The solid oxide fuel cell stack of Claim 1, wherein a power to heat said interconnect is less than or equal to about 6 watts/cell.

11. The solid oxide fuel cell stack of Claim 10, wherein said power is less than or equal to about 5 watts/cell.

12. The solid oxide fuel cell stack of Claim 11, wherein said power is less than or equal to about 4.5 watts/cell.

13. The solid oxide fuel cell stack of Claim 1, wherein said interconnect comprises a material selected from the group comprising silver, copper, ferrous materials, strontium, lanthanum, chromium, chrome, gold, platinum, palladium, nickel, titanium, conducting ceramics, as well as alloys, oxides, cermets, composites, and combinations comprising at least one of the foregoing materials.

14. A solid oxide fuel cell stack system, comprising:
an electrochemical cell having an electrolyte disposed between and in ionic communication with a first electrode and a second electrode;
at least one interconnect disposed in fluid and thermal communication with at least a portion of said electrochemical cell, said interconnect comprising an electrical supply connector; and
a power supply disposed in electrical communication with said electrical supply connector.

15. The solid oxide fuel cell stack system of Claim 14, wherein said power supply is selected from the group consisting of a battery, an alternator, and combinations comprising at least one of the foregoing power supplies.

16. The solid oxide fuel cell stack system of Claim 14, wherein said electrical supply connector further comprising a control switch.

17. A method for heating a solid oxide fuel cell stack, comprising:

supplying electrical power to an interconnect of an electrochemical cell stack, said electrochemical cell stack comprising
5 electrochemical cells each having an electrolyte disposed between and in ionic communication with a first electrode and a second electrode, and said interconnect disposed between adjacent electrochemical cells and in fluid and thermal communication with at least a portion of said electrochemical cell, and said interconnect comprising an electrical supply connector.

18. The method of Claim 17, wherein said interconnect has a thickness of less than about 1 mm.

19. The method of Claim 17, wherein said interconnect has a thickness of less than about 0.1 mm.

20. The method of Claim 17, wherein said interconnect has a thickness of less than about 0.05 mm.

21. The method of Claim 17, wherein said heating said interconnect is by converting electrical energy to thermal energy.

22. The method of Claim 17, further comprising simultaneously supplying electrical power to all of said interconnects.

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23. The method of Claim 17, stopping the supply of electrical power to said interconnect when said interconnect attains a temperature of greater than or equal to about 600°C.

24. The method of Claim 23, wherein said temperature is greater than or equal to about 700°C.

25. The method of Claim 24, wherein said temperature is greater than or equal to about 700°C in a period of less than or equal to about 20 minutes.

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